

533504

Rec'd PTO 02 MAY 2005

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date
21 May 2004 (21.05.2004)

PCT

(10) International Publication Number
WO 2004/042925 A1

(51) International Patent Classification⁷: H03L 7/085,
H03D 3/00

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(21) International Application Number:
PCT/IB2003/004467

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(22) International Filing Date: 8 October 2003 (08.10.2003)

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE,
GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR,
KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK,
MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT,
RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR,
TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(25) Filing Language: English

(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(26) Publication Language: English

(30) Priority Data:
02079608.2 5 November 2002 (05.11.2002) EP

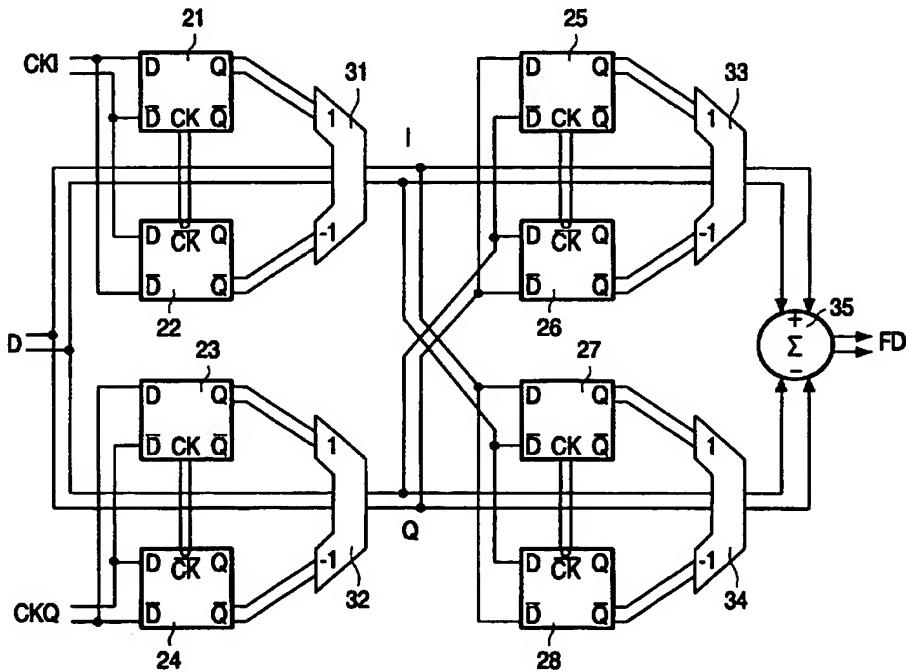
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[Continued on next page]

(54) Title: PLL WITH BALANCED QUADRICORRELATOR



WO 2004/042925 A1

(57) Abstract: A Phase Locked Loop (1) comprising a frequency detector (10) including a balanced quadricorrelator (2), the loop (1) being characterized in that the quadricorrelator (2) comprises double edge clocked bi-stable circuits (21, 22, 23, 24, 25, 26, 27, 28) coupled to multiplexers (31, 32, 33, 34) being controlled by a signal having the same bitrate as the incoming D signal (D).

**Declaration under Rule 4.17:**

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU,*

TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

Published:

— *with international search report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

Inte... Application No
PCT/1B 03/04467

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H03L7/085 H03D3/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H03L H03D G06G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category ^a	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	<p>SAVOJ J ET AL: "Design of half-rate clock and data recovery circuits for optical communication systems" PROCEEDINGS OF THE 38TH. ANNUAL DESIGN AUTOMATION CONFERENCE. (DAC). LAS VEGAS, NV, JUNE 18 - 22, 2001, PROCEEDINGS OF THE DESIGN AUTOMATION CONFERENCE, NEW YORK, NY: ACM, US, vol. CONF. 38, 18 June 2001 (2001-06-18), pages 121-126, XP010552368 ISBN: 1-58113-297-2 the whole document</p> <p>---</p> <p style="text-align: center;">-/--</p>	1-7



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the International filing date
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Date of the actual completion of the international search

23 December 2003

Date of mailing of the International search report

23/01/2004

Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

Application No
PCT/IB 03/04467

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	<p>CHAN GEUN YOON ET AL: "DIGITAL LOGIC IMPLEMENTATION OF THE QUADRICORRELATORS FOR FREQUENCYDETECTOR" PROCEEDINGS OF THE MIDWEST SYMPOSIUM ON CIRCUITS AND SYSTEMS. LAFAYETTE, AUG. 3 - 5, 1994, NEW YORK, IEEE, US, vol. 2 SYMP. 37, 3 August 1994 (1994-08-03), pages 757-760, XP000531787 ISBN: 0-7803-2429-3 cited in the application the whole document</p> <p>---</p>	1-7
Y	<p>US 2002/085657 A1 (BOERSTLER DAVID WILLIAM) 4 July 2002 (2002-07-04) paragraph '0051! - paragraph '0053!; figures 8-12</p> <p>---</p>	1-7
A	<p>C.K. KEN YANG: "Timing Recovery" COURSE EE219A LECTURE 17, 'Online! 4 June 2001 (2001-06-04), XP002264983 Retrieved from the Internet: <URL:www.icsl.ucla.edu/{yang/ee219a/ee219a_lect_crc.pdf> 'retrieved on 2003-12-12! page 9 page 12 -page 13</p> <p>-----</p>	1-7

INTERNATIONAL SEARCH REPORTInventor's name
PCT/IB 03/04467

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2002085657	A1 04-07-2002	NONE	